

REMARKS

Applicants thank the Examiner for the thorough consideration given the present application. Claims 1, 2, 5-9 and 11, 12, 14 and 22 are pending. Claims 15-21 have been canceled without prejudice to filing them in a continuing Application. Claims 3, 4, 10 and 13 are also canceled. Claims 1, 6 and 12 are independent. Reconsideration of this application is respectfully requested.

Allowed and Allowable Subject Matter

Applicants acknowledge with appreciation the allowance of claims 1, 2 and 5. Applicants also acknowledge with appreciation the indication of allowable subject matter in claims 14 and 22, which depend from claim 12, which is under rejection. Applicants have not re-written claims 14 and 22 in independent form at this time, however, because of Applicants' belief that claim 12, from which claims 14 and 22 depend, is patentable over the applied art, for reasons presented, below.

Claim Rejections under 35 U.S.C. § 103(a)

The Office Action rejects claims 6-9 and 11 under 35 U.S.C. § 103(a) as unpatentable over Han in view of U.S. Patent 6,025,605 to Lyu. This rejection is respectfully traversed.

Because the rejection is based on 35 U.S.C. §103, what is in issue in such a rejection is "the invention as a whole," not just a few features of the claimed invention. Under 35 U.S.C. §103, " [a] patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." The determination under §103 is whether the claimed invention as a whole would have been obvious to a person of ordinary skill in the art at the time the invention was made. See In re O'Farrell, 853 F.2d 894, 902, 7 USPQ2d 1673, 1680 (Fed. Cir. 1988). In determining obviousness, the invention must be considered as a whole and the claims must be considered in their entirety. See Medtronic, Inc. v. Cardiac Pacemakers, Inc., 721 F.2d 1563, 1567, 220 USPQ 97, 101 (Fed. Cir. 1983).

In rejecting claims under 35 U.S.C. § 103, it is incumbent on the Examiner to establish a factual basis to support the legal conclusion of obviousness. See, In re Fine, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the Examiner is expected to make the factual determinations set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), and to

provide a reason why one of ordinary skill in the pertinent art would have been led to modify the prior art or to combine prior art references to arrive at the claimed invention. Such reason must stem from some teaching, suggestion or implication in the prior art as a whole or knowledge generally available to one having ordinary skill in the art. Uniroyal Inc. v. F-Wiley Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir. 1988), cert. denied, 488 U.S. 825 (1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017 (1986); ACS Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). These showings by the Examiner are an essential part of complying with the burden of presenting a *prima facie* case of obviousness. Note, In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. In re Fritch, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1783-84 (Fed. Cir. 1992). To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be suggested or taught by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1970). All words in a claim must be considered in judging the patentability of that claim against the prior art. In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

A showing of a suggestion, teaching, or motivation to combine the prior art references is an "essential evidentiary component of an obviousness holding."

C.R. Bard, Inc. v. M3 Sys. Inc., 157 F.3d 1340, 1352, 48 USPQ2d 1225, 1232 (Fed. Cir. 1998). This showing must be clear and particular, and broad conclusory statements about the teaching of multiple references, standing alone, are not "evidence." See In re Dembiczak, 175 F.3d 994 at 1000, 50 USPQ2d 1614 at 1617 (Fed. Cir. 1999).

A factual inquiry whether to modify a reference must be based on objective evidence of record, not merely conclusory statements of the Examiner. See, In re Lee, 277 F.3d 1338, 1343, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002). This underscores the failure of the Office Action to comply with existing case law requirements for supporting a rejection under 35 U.S.C. §103.

Additionally, the Examiner may not pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art. Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve Inc., 796 F.2d 443, 448, 230 USPQ 416, 419 (Fed. Cir. 1986), cert. denied, 484 U.S. 823 (1987) and In re Kamm, 452 F.2d 1052, 1057, 172 USPQ 298, 301-2 (CCPA 1972), and obviousness cannot be established by locating references which describe various aspects of appellant's invention without also providing evidence of the motivating force which would impel one skilled in the art to do what appellants have done. Ex parte Levengood, 28 USPQ2d 1300, 1302 (Bd. App. & Int. 1993). Here the Office Action fails to present any persuasive evidence of such a motivating force.

The Office Action alleges that Han discloses the features recited in claims 6-9 and 11 except for the alignment of the ends of the thin film transistor with the ends of the source and drain electrodes and being located below the source and drain electrodes. The Office Action relies on Lyu for disclosure of a semiconductor layer and an ohmic contact layer having ends lined with and directly below corresponding ends of the source electrode and drain electrode. The Office Action concludes that it would be obvious to modify Han to provide such a feature "for the purpose of simplifying the production process and reducing manufacturing costs."

Applicants again respectfully submit that this alleged motivation is not supported by objective evidence of record and is improperly based solely on speculation unsupported by objective evidence of record.

In the first place, Lyu discloses that the ends of the second metal layer 143, the n-plus semiconductor layer 139 and semiconductor layer 137 are aligned in col. 3, lines 55-62. No reason for forming them in that manner is stated. All that is stated is "[S]econd metal layer 143, n-plus semiconductor layer 139, and semiconductor layer 137 are then patterned into a desired shape, as shown in Fig. 3F."

No reason is given by Lyu to explain why this shape is desired.

More particularly, there is no disclosure in Lyu that the desired shape is achieved for the purpose of simplifying the production process and/or for reducing manufacturing costs.

These reasons are based purely on speculation by the Examiner and are not supported by any objective evidence of record.

In response to these arguments, which were presented in the Amendment filed on February 7, 2005, the Office Action states that this statement of motivation finds support in the Abstract of Lyu. According to the Office Action, “[I]n the abstract, Lyu states that the semiconductor layers are patterned and etched at the same time as the source and drain metallizations, and that using this single etch process reduces manufacturing costs.”

Applicants respectfully disagree with this response. In fact, Lyu only states that (1) the source and drain layers and **doped and undoped** semiconductor layers are patterned at the same time, and (2) source and drain metallizations and the **doped** semiconductor layer are etched in a single etching step using an insulating passivation layer as a mask to form source and drain electrodes. Lyu simply does **not** state in the abstract that “the semiconductor layers are patterned and etched at the same time as the source and drain electrodes, as alleged in the Office Action. Moreover, the patterning and etching steps are disclosed as sequential, not simultaneous – see col. 3, last full paragraph.

The Office Action continues by stating that, “as shown in Figure 3F of Lyu, patterning and etching the source/drain electrodes at the same time as the semiconductor layers results in the ends being aligned, as claimed.” Applicants respectfully disagree for a number of reasons including the fact that Lyu teaches a fundamentally different source and drain electrode forming process than does

Han, and this fundamental difference teaches away from modifying Han in view of Lyu, as suggested.

Lyu's process works the way it does because Lyu forms an etch stop 140 prior to forming the separate source and drain electrodes in Fig. 3I. Because of this, Lyu can perform the step shown in its Fig. 3F, which results in aligning the ends of the doped and undoped semiconductor layers 139 and 137 and metal layer 143 prior to forming the separate source and drain electrodes.

However, one of ordinary skill in the art would not have any incentive to modify Han, which already formed its separate source and drain electrodes as shown in Fig. 5C. The Office Action does not explain why one of ordinary skill in the art would want to modify Han, which has already formed separate source and drain electrodes as shown in Han's Fig. 5C and separate doped semiconductor ohmic contact layers 112 under each of the source and drain electrodes as shown in Fig. 5D, by patterning source and drain metallizations and doped semiconductor and undoped semiconductor layers at one time, as taught by Lyu, because Han cannot do so, having already formed the source and drain metallizations and doped semiconductor layer (ohmic contact layer in Han), and because Han does not have an etch stopper 140 as Lyu does, so that Han's device would be ruined if the proposed simultaneous patterning and ensuing etching were performed.

Thus, the alleged motivation for combining these references is improper.

The argument in the “Response to Arguments” section of the Office Action in support of the conclusion that Han does disclose a contact hole exposing a top surface of the drain electrode 106 but not the side surface is also unpersuasive.

In this regard, the Office Action argues that “the slanted portion at approximately the middle of the drain electrode 106 can be considered a side surface, since it is facing to the right. Furthermore, the top surface itself can be considered a side surface, since it could be referred to as the ‘top side’. For instance, a cube has six sides and one of those sides could be called the top side.”

Applicants do not find these arguments persuasive for a number of reasons.

Firstly, “the slanted portion at approximately the middle of the drain electrode” is just that, a middle portion of the drain electrode, and clearly is not “a side portion” of the drain electrode. Applicants respectfully submit that Han’s drain electrode 106 has top, bottom and side portions and that only the top portion of drain electrode 106 is exposed by the contact hole.

Secondly, Han’s 116 clearly only exposes the top surface of the drain electrode 106, regardless of whether the drain electrode has a bend in it. A bend in a top surface does not make that top surface a side surface of the electrode.

Thirdly, the relevance of a cube to Han’s drain electrode 106 has not been explained, nor is it clear.

Fourthly, claim 6 includes the orientation term “below” to define the invention and, in the context of claim 6, a top surface cannot be a side surface because those surfaces are construed by one of ordinary skill in the art reading claim 6 in terms of

a feature recited as being “directly below an end of the source electrode.” Applicants respectfully submit that this means, to one of ordinary skill in the art, that a top surface of the recited electrode is above, rather than below, the recited feature, and “side” does not mean “top” in the context of claim 6, as recited. Moreover, a factual inquiry whether to modify a reference must be based on objective evidence of record, not merely conclusory statements of the Examiner. See, In re Lee, 277 F.3d 1338, 1343, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002).

As is well settled, a rejection based on §103 must rest on a factual basis, with the facts being interpreted without hindsight reconstruction of the invention from the prior art. In making this evaluation, the Examiner has the initial duty of supplying the factual basis for the rejection advanced. An Examiner may not, because of doubts that the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in the factual basis. See, In re Warner, 379 F.2d 1011, 1017, 154 USPQ 173, 178 (CCPA 1967), cert. denied, 389 U.S. 1057 (1968).

So, even if one of ordinary skill in the art were properly motivated to modify Han in view of Lyu, as suggested (which is not proper for the reasons presented above), the resulting reference combination would not result in, or render obvious, the claimed invention.

Accordingly, the Office Action fails to make out a *prima facie* case of obviousness of the claimed invention.

Reconsideration and withdrawal of this rejection of claims 6-9 and 11 is respectfully requested.

Claim 12 stands rejected under 35 U.S.C. §103(a) as unpatentable over U.S. Patent 6,509,940 to Kwak in view of Lyu. This rejection is respectfully traversed.

Applicants respectfully submit that Kwak is not a proper reference to apply under 35 U.S.C. §103(a) because, at the time of Applicant's invention, the Kwak patent was either commonly assigned to, or under an obligation to be assigned to, LG Philips LCD Co., Ltd., the assignee of this application. See, in this regard, 35 U.S.C. §103(c).

In the alternative, Applicants respectfully submit that the Office Action does not make out a *prima facie* case of proper motivation to modify Kwak in view of Lyu, as suggested.

The Office Action alleges that it would be obvious to modify Kwak by using the layer alignment technique of Lyu for the purpose of simplifying the production process and reducing manufacturing costs, citing Lyu's abstract.

Applicants respectfully submit that this alleged motivation is not supported by objective evidence of record and is improperly based solely on speculation unsupported by objective evidence of record.

In the first place, Lyu discloses that the ends of the second metal layer 143, the n-plus semiconductor layer 139 and semiconductor layer 137 are aligned in col. 3, lines 55-62. No reason for forming them in that manner is stated. All that

is stated is “[S]econd metal layer 143, n-plus semiconductor layer 139, and semiconductor layer 137 are then patterned into a desired shape, as shown in Fig. 3F.”

No reason is given to explain why this shape is desired.

More particularly, there is no disclosure in Lyu that the desired shape is achieved for the purpose of simplifying the production process and/or for reducing manufacturing costs.

As is well settled, a rejection based on 35 U.S.C. §103 must rest on a factual basis, with the facts being interpreted without hindsight reconstruction of the invention from the prior art. In making this evaluation, the Examiner has the initial duty of supplying the factual basis for the rejection advanced. An Examiner may not, because of doubts that the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in the factual basis. See, In re Warner, 379 F.2d 1011, 1017, 154 USPQ 173, 178 (CCPA 1967), cert. denied, 389 U.S. 1057 (1968).

Moreover, one of ordinary skill in the art would not have any incentive to modify Kwak, which already formed its separate source and drain electrodes as shown in Fig. 7B. The Office Action does not explain why one of ordinary skill in the art would want to modify Kwak, which has already formed separate source and drain electrodes as shown in Kwak’s Fig. 7B and separate ohmic contact layers 39 under each of the source and drain electrodes as shown in Fig. 7B, by patterning source and drain metallizations and doped semiconductor and undoped

semiconductor layers at one time, as taught by Lyu, because Kwak cannot do so, having already formed the source and drain metallizations and ohmic contact layers, and because Kwak does not have an etch stopper 140 as Lyu does, so that Kwak's device would be ruined if the proposed simultaneous patterning and ensuing etching were performed.

Thus, the alleged motivation for combining these references, which is wholly speculative and not supported by objective evidence, is improper.

Accordingly, the Office Action fails to make out a *prima facie* case of obviousness of the claimed invention.

Reconsideration and withdrawal of this rejection of claim 12 is respectfully requested.

CONCLUSION

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Robert J. Webster, Registration No. 46,472, at the telephone number of the undersigned below, for example, to conduct an interview in an effort to resolve the outstanding matters and to expedite prosecution of the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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